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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/689,986	10/22/2003	Youngho Ahn	GCTS-0029	8957

34610 7590 05/18/2004

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EXAMINER	
LAM, TUAN THIEU	
ART UNIT	**PAPER NUMBER**
2816	

DATE MAILED: 05/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/689,986	AHN ET AL.	
	Examiner	Art Unit	
	Tuan T. Lam	2816	

-- The MAILING DATE of this communication appears on the cover sheet with the corresp ndenc address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 February 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-44* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8,10,12,14-24,26,28,30-38,40 and 42* is/are rejected.

7)☒ Claim(s) *9,11,13,25,27,29,39,41 and 43* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *04 February 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *11/20/2003*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 10, 12, 26, 28, 40 and 42 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 10, 26 and 40, the recitation of R, K, P, S, $N_{\Sigma\Delta}$ and $D_{\Sigma\Delta}$ lacks proper antecedent basis. It is unclear as to what they are. Clarification is required.

In claims 12, 28 and 42, the recitation of P_{new} , S_{new} , N_{new} and D_{new} lacks proper antecedent basis.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-8, 14-24, 30-38 and 44 are rejected under 35 U.S.C. 102(e) as being anticipated by Tsuda et al. (US 2003/0062959). Figure 1 of Tsuda shows a noise suppression circuit comprising steps of generating a frequency signal (OUT) from a PLL based on a reference signal (REF), removing noise from the frequency signal by shifting a spurious signal of a

predetermined order outside a loop bandwidth of the PLL (column 6, paragraphs 0086 to 0090) as called for in claims 1, 14, 30 and 44.

Regarding claim 2, the loop bandwidth is the cutoff frequency of a loop filter in the PLL is seen as the cut off frequency of the loop filter of PLL 100 of figure 1.

Regarding claim 3, the loop bandwidth of the PLL 100 corresponds to a frequency range that lies between the frequency signal generated from the PLL and a cutoff frequency of a loop filter in the PLL.

Regarding claim 4, shifting the first order is anticipated by shifting the beat component as disclosed in Tsuda's paragraph 0086.

Regarding claim 5, setting a frequency divider in a feedback loop of the PLL to a value which shifts the spurious signal of said predetermined order outside of the loop bandwidth of the PLL is anticipated by the frequency dividing number control circuit (6) and the frequency divider (5).

Regarding claim 6, the frequency divider 5 of Tsuda is set by a sigma delta modulator (6).

Regarding claim 7, the frequency divider (5) of Tsuda is a fractional integer divider inherently having a pulse swallow frequency divider.

Regarding claim 8, the ratio of modulation is being anticipated by figures 13 and 15. The modulation ratio is the ratio of I and M.

Regarding claims 15 and 31, figure 1 shows a reference signal being modulated by modulator circuit (7), generating a frequency signal (OUT) from a PLL (100) based on the modulated reference signal, wherein modulating the reference frequency generates a frequency

separation between harmonics of the modulated reference signal and the reference that suppresses noise in the frequency signal.

Regarding claims 16 and 32 using the modulated reference signal (REFM) to generate the frequency signal from the PLL as along as the harmonics of the modulated reference signal is not coincident with the harmonics of the reference signal.

Regarding claim 17, figure shows a PLL generates a frequency signal (OUT) based on a reference signal (REF), a noise suppressor (6, 7) which shifts a spurious signal of a predetermined order outside a loop bandwidth of the PLL.

Regarding claim 18, the loop bandwidth is the cutoff frequency of a loop filter in the PLL is seen as the cut off frequency of the loop filter of PLL 100 of figure 1.

Regarding claim 19, the loop bandwidth of the PLL 100 corresponds to a frequency range that lies between the frequency signal generated from the PLL and a cutoff frequency of a loop filter in the PLL.

Regarding claim 20, shifting the first order is anticipated by shifting the beat component as disclosed in Tsuda's paragraph 0086.

Regarding claim 21, setting a frequency divider in a feedback loop of the PLL to a value which shifts the spurious signal of said predetermined order outside of the loop bandwidth of the PLL is anticipated by the frequency dividing number control circuit (6) and the frequency divider (5).

Regarding claim 22, the frequency divider 5 of Tsuda is set by a sigma delta modulator (6).

Regarding claim 23, the frequency divider (5) of Tsuda is a fractional integer divider inherently having a pulse swallow frequency divider.

Regarding claim 24, the ratio of modulation is being anticipated by figures 13 and 15. The modulation ratio is the ratio of I and M.

Regarding claim 33, figure 1 shows PLL comprising a divider (5) dividing a frequency signal (OUT) form PLL (100), a controller (6) which sets the divider to a value which shifts a spurious noise signal of a predetermined order outside loop bandwidth of the PLL.

Regarding claim 34, the loop bandwidth is the cutoff frequency of a loop filter in the PLL is seen as the cut off frequency of the loop filter of PLL 100 of figure 1.

Regarding claim 35, the loop bandwidth of the PLL 100 corresponds to a frequency range that lies between the frequency signal generated from the PLL and a cutoff frequency of a loop filter in the PLL.

Regarding claim 36, shifting the first order is anticipated by shifting the beat component as disclosed in Tsuda's paragraph 0086.

Regarding claim 37, the frequency divider (5) of Tsuda is a fractional integer divider inherently having a pulse swallow frequency divider.

Regarding claim 38, the ratio of modulation is being anticipated by figures 13 and 15. The modulation ratio is the ratio of I and M.

Allowable Subject Matter

5. Claims 9, 11, 13, 25, 27, 29, 39, 41 and 43 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. Claims 10, 12, 26, 28, 40 and 42 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. In this regard, applicant's cited prior art has been carefully considered.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan T. Lam whose telephone number is 571-272-1744. The examiner can normally be reached on Monday to Friday (7:30 am to 6:00pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, TIMOTHY P CALLAHAN can be reached on 571-272-1740. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tuan T. Lam
Primary Examiner
Art Unit 2816

5/4/2004